

Prmt5 Cas9-CKO Strategy

Designer:

Ruirui Zhang

Reviewer

Huimin Su

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Project Overview

Project Name

Prmt5

Project type

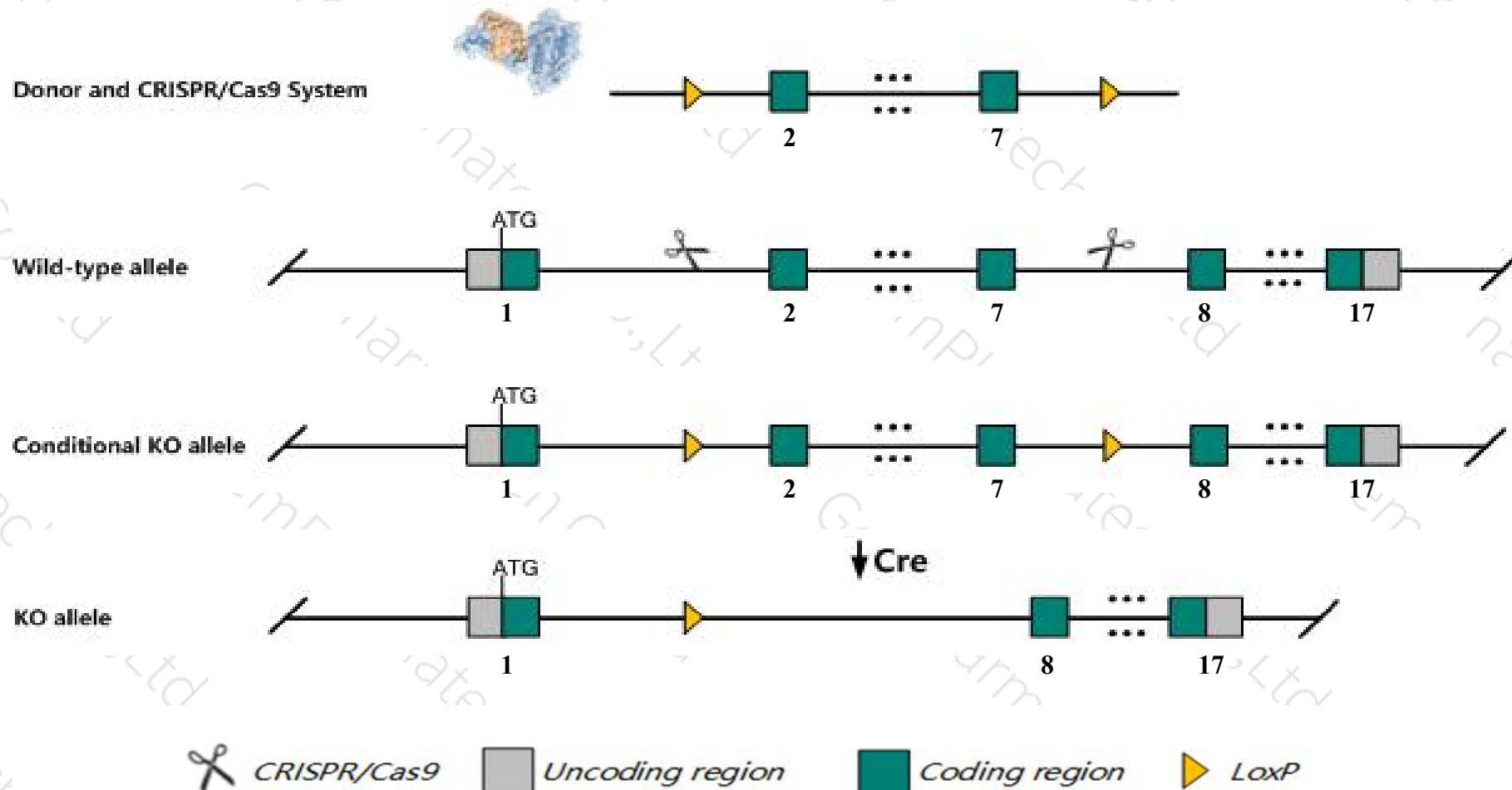
Cas9-CKO

Strain background

C57BL/6JGpt

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Prmt5* gene. The schematic diagram is as follows:



- The *Prmt5* gene has 7 transcripts. According to the structure of *Prmt5* gene, exon2-exon7 of *Prmt5*-201 (ENSMUST00000023873.11) transcript is recommended as the knockout region. The region contains 667bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Prmt5* gene. The brief process is as follows: CRISPR/Cas9 system and Donor were microinjected into the fertilized eggs of C57BL/6JGpt mice. Fertilized eggs were transplanted to obtain positive F0 mice which were confirmed by PCR and sequencing. A stable F1 generation mouse model was obtained by mating positive F0 generation mice with C57BL/6JGpt mice.
- The flox mice will be knocked out after mating with mice expressing Cre recombinase, resulting in the loss of function of the target gene in specific tissues and cell types.

- According to the existing MGI data, mice homozygous for a null allele display embryonic lethality before somite formation with failure of inner cell mass proliferation.
- The *Prmt5* gene is located on the Chr14. If the knockout mice are crossed with other mice strains to obtain double gene positive homozygous mouse offspring, please avoid the two genes on the same chromosome.
- This strategy is designed based on genetic information in existing databases. Due to the complexity of biological processes, all risk of loxp insertion on gene transcription, RNA splicing and protein translation cannot be predicted at existing technological level.

Gene information (NCBI)

Prmt5 protein arginine N-methyltransferase 5 [*Mus musculus* (house mouse)]

Gene ID: 27374, updated on 12-Aug-2019

Summary

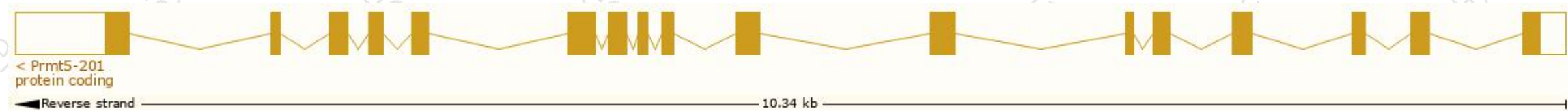
Official Symbol	Prmt5 provided by MGI
Official Full Name	protein arginine N-methyltransferase 5 provided by MGI
Primary source	MGI:MGI:1351645
See related	Ensembl:ENSMUSG000000023110
Gene type	protein coding
RefSeq status	REVIEWED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	Jbp1; Skb1
Summary	This gene encodes an enzyme that belongs to the methyltransferase family. The encoded protein catalyzes the transfer of methyl groups to the amino acid arginine, in target proteins that include histones, transcriptional elongation factors and the tumor suppressor p53. This gene plays a role in several cellular processes, including transcriptional regulation and the assembly of small nuclear ribonucleoproteins. Alternative splicing results in multiple transcript variants encoding different isoforms. [provided by RefSeq, Sep 2015]
Expression	Ubiquitous expression in CNS E11.5 (RPKM 31.6), CNS E14 (RPKM 26.3) and 28 other tissues See more
Orthologs	human all

Transcript information (Ensembl)

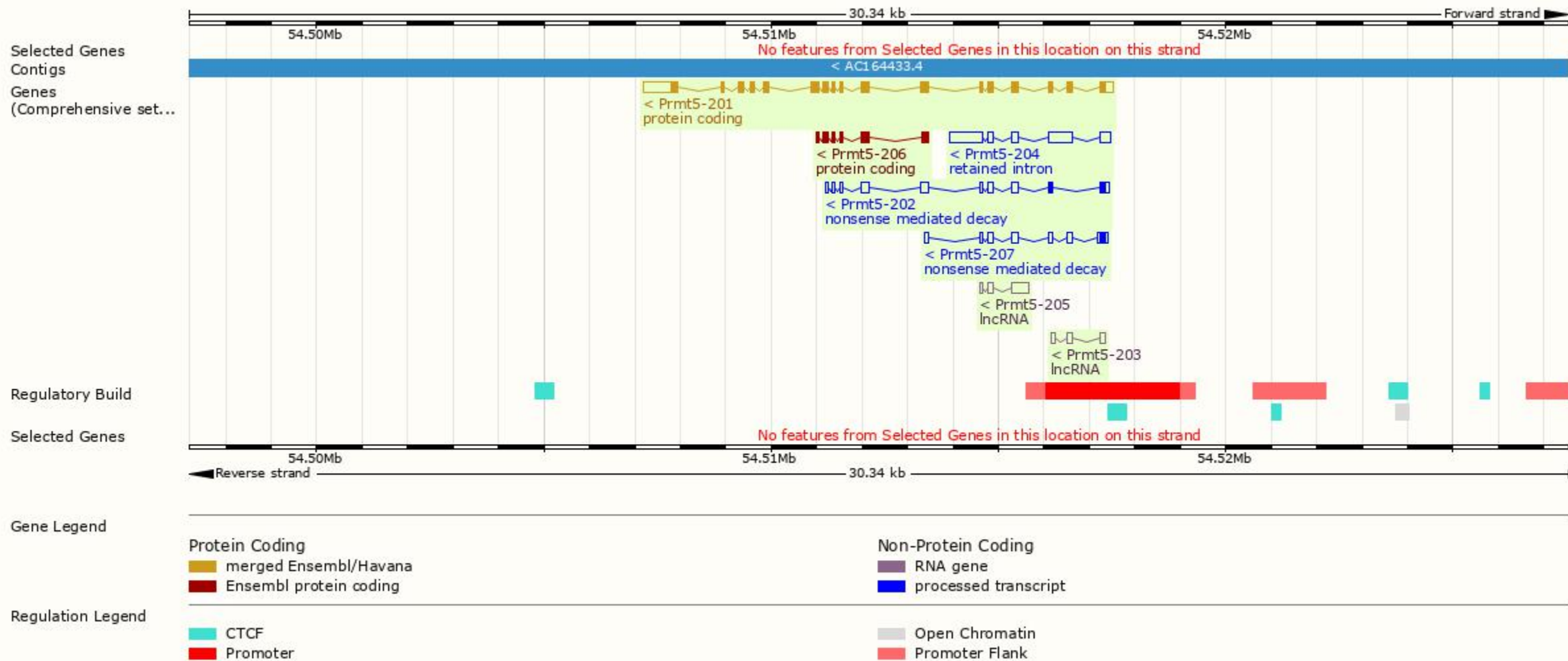
The gene has 7 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Prmt5-201	ENSMUST00000023873.11	2691	637aa	Protein coding	CCDS27091	A0A0R4J049	TSL:1 GENCODE basic APPRIS P1
Prmt5-206	ENSMUST00000139964.1	609	203aa	Protein coding	-	F6QQQ6	5' and 3' truncations in transcript evidence prevent annotation of the start and the end of the CDS. CDS 5' and 3' incomplete TSL:3
Prmt5-202	ENSMUST00000132227.8	1094	63aa	Nonsense mediated decay	-	S4R295	TSL:5
Prmt5-207	ENSMUST00000147214.7	811	37aa	Nonsense mediated decay	-	A0A2I3BRG2	TSL:3
Prmt5-205	ENSMUST00000138367.1	521	No protein	Processed transcript	-	-	TSL:2
Prmt5-203	ENSMUST00000132801.1	338	No protein	Processed transcript	-	-	TSL:5
Prmt5-204	ENSMUST00000133552.7	1692	No protein	Retained intron	-	-	TSL:1

The strategy is based on the design of *Prmt5-201* transcript,The transcription is shown below



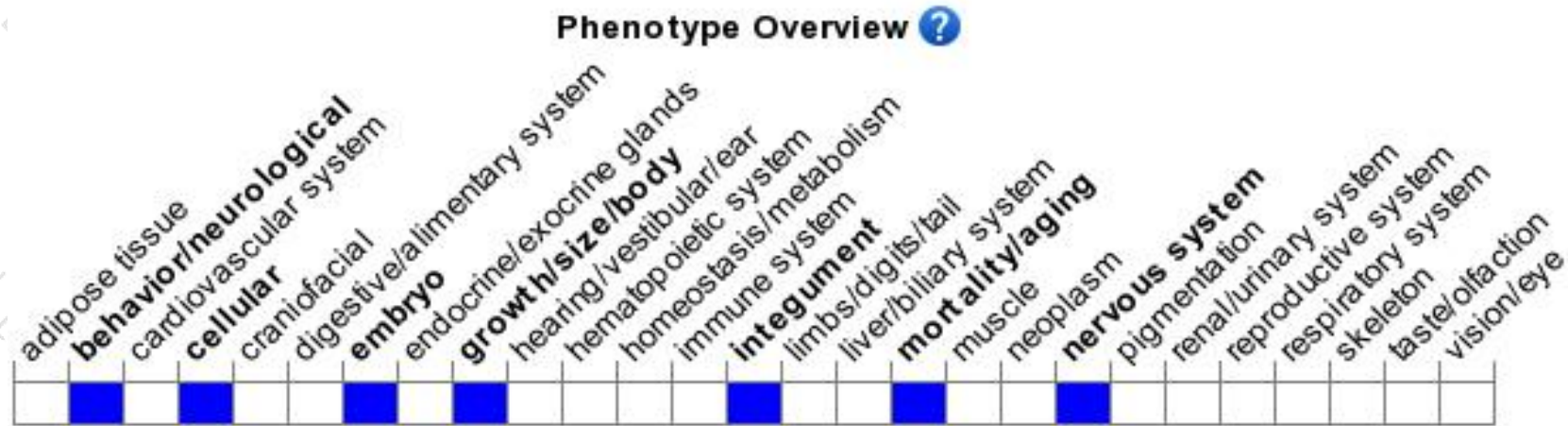
Genomic location distribution



Protein domain



Mouse phenotype description(MGI)



Phenotypes affected by the gene are marked in blue. Data quoted from MGI database(<http://www.informatics.jax.org/>).

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If you have any questions, you are welcome to inquire.

Tel: 400-9660890

